UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,905	12/05/2006	**Shinya Yamanaka**	701049	9924

23460 7590 03/24/2009

LEYDIG VOIT & MAYER, LTD
TWO PRUDENTIAL PLAZA, SUITE 4900
180 NORTH STETSON AVENUE
CHICAGO, IL 60601-6731

EXAMINER	
CROUCH, DEBORAH	
ART UNIT	**PAPER NUMBER**
1632	

MAIL DATE	DELIVERY MODE
03/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,905	YAMANAKA, SHINYA	
	Examiner	Art Unit	
	Deborah Crouch	1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *03 December 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16,21-41,43-57 and 61-69* is/are pending in the application.

4a) Of the above claim(s) *21,33-41,44-57 and 61-69* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16,22-32 and 43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *August 18, 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/16/06; 4/9/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Applicant's election without traverse of group I, claims 1-16, 22-32 and 43 in the reply filed on December 3, 2008 is acknowledged.

Claims 1-16, 22-32 and 43 are objected too. The selection step should be indicated as step (c). See claim 1 as an example.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 2, 6, 7, 10 and 11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification fails to provide adequate evidence of possession and contemplation of embryonic cell associated transcript genes ECAT1, 2, 6, 7, 8 and 9. While applicant has disclosed a specific sequence for each of these transcripts, their function in ES cell physiology, such as maintaining pluripotency, support of self-renewal or other such activity, is described neither in the specification nor the art at the time of filing. Thus, the claims containing language to ECAT 1, 2, 6, 7, 8 and 9 only have written description and evidence of contemplation for the specific sequence taught (specification, page 20, Table 1).

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111, clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed*." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See *Vas-Cath* at page 1116). As stated above, and for the reasons above, there is no evidence in the specification that at the effective filing date, applicant had possession of ECAT 1, 2, 6, 7, 8 and 9 nucleic acid sequences other than the specific SEQ ID NO: found in Table 1 (specification, page 20). The skilled artisan could not have envision, at the time of filing, the detailed chemical structure of the encompassed by ECAT 1, 2, 6, 7, 8 and 9, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that ECAT 1, 2, 6, 7, 8 and 9 are a part of the invention and reference to a potential method of isolating them. Names of nucleic acid sequences do not impart structure. See *Fiers v. Revel*, 25 USPQ2d 1601 at 1606 (CAFC 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481 at 1483. In *Fiddes*, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class.

For these reasons, claims 2, 6, 7, 10 and 11 (ECAT 1, 2, 6, 7, 8 and 9) are limited to the specific SEQ ID NO: of Table 1.

Claims 2, 6, 7, 10 and 11 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for methods of screening for factors that affect expression of ECAT 1, 2, 6, 7, 8 and 9 as depicted in Table 1, does not reasonably provide enablement for the broad category of nucleic acids encompassed by ECAT 1, 2, 6, 7, 8 and 9. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The ECAT nucleic acids have been identified as specifically expressed mRNAs found in human and mouse ES cells. As such the related ECAT genes are believed to be associated with those events that essentially make and ES cell an ES cells - self renewal, pluripotency and teratoma formation. In this regard the specification discloses both human and mouse nucleic acid and amino acid sequences for ECAT 1, 2, 6, 7, 8 and 9. However, the proteins encoded have no known specific function. As a consequence, there is no assay disclosed for determining which amino acid alterations would permit the ECAT function to remain. It is particularly noteworthy that ECAT 3 (FBx15) is involved with the ES cell property of self-renewal. ECAT4 (Nanog) is involved with the ES cells property of pluripotency. ECAT5 (Eras) is involved with the ES cell property of tumor formation. Thus, given that the known ECAT genes are associated with specific ES cell properties, and the remaining ECAT genes have no know function, the skilled artisan at the time of filing would have had no readily available assay to determine those variants of SEQ ID NO: 1-8 and 21-34 that would possess the ES cell relevant property. It is noted that ECAT 3, 4 and 5 have such an assay. For this reason,

claims 2, 6, 7, 10 and 11 lack enablement for their full breadth. The skilled artisan would have needed to engage in an undue amount of experimentation without a predictable degree of success to implement the claimed invention.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 26-32 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ying et al, Nature, April 2002, Vol. 416 pages 545-548.

Ying teaches neurospheres, which are, a type of somatic cell, produced in vitro by the culture of dissociated forebrains from transgenic mice that express a knockin GFP construct knocked into the Oct4 locus such that regulation of GFP expression occurs from the Oct4 promoter (page 545, col. 2, parag. 3, lines 4-9). Oct4 is defined as an ECAT gene (specification, page 20, lines 20-22). The specification offers no definition or description of the claimed somatic cell such that a difference between the cell of the claims and that of Ying can be distinguished. The somatic cells of Ying inherent contain Nanog. There is no means to distinguish mouse endogenous Nanog from mouse exogenous Nanog. Thus, Ying clearly anticipates the presently claimed invention.

Claims 26-32 and 43 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Mitsui et al., Cell, May 2003, Vol. 113, pp. 631-642.

Mitsui teaches mouse ES cells comprising a knockin construct such that expression of a marker gene is regulated by the Nanog (ECAT4) promoter differentiated into cells with parietal endoderm-like morphology, indicating these cells are somatic cells (page 635, col. 1, parag. 3, lines 4-6 and col. 2, lines 4-6). Further, the parietal endoderm-like cells can be considered an emerging cell (claim 43). The specification does not provide any definition or description of a somatic cell or an emerging cell that distinguishes between the claimed cells and those of Mitsui. Therefore Mitsui clearly anticipates the claimed invention.

Claim 43 rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ying et al. Nature Biotechnology, April 2003, Vol. 21, pp. 183-186.

Ying teaches mouse ES cells comprising a GFP gene knockin construct such that expression of GFP is regulated by the Oct4 promoter (page 184, col. 2, parag. 1, lines 1-3). Also, taught is a hybrid ES-neural cell produced by the in vitro differentiation of mouse ES cells expressing the knockin GFP construct, where the cells express GFP and then GFP and nestin together (page 184, col. 2, parag. 2, lines 4-11). Thus, these cells disclosed by Ying anticipate the claim as presently written.

Claims 1-16 and 22-25 are free of the prior art. At the time of filing, the prior did not teach or suggest methods of screening for a somatic cell nuclear reprogramming substance comprising (a) contacting a somatic cell comprising a gene wherein a marker gene is present at a position permitting expression control by the expression control region of an ECAT gene, and a test substance, (b) determining the presence or

absence of the emergence of cells expressing the marker gene, and (c) selecting a test substance allowing the emergence of the cells as a somatic cell nuclear reprogramming substance candidate.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Crouch, Ph.D. whose telephone number is (571)272-0727. The examiner can normally be reached on M-Fri, 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Paras can be reached on 571-272-4517. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah Crouch/
Primary Examiner, Art Unit 1632